

A MONOGRAPH OF THE GENUS TECTONA AS IT OCCURS IN AMERICA  
AND IN CULTIVATION

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The following is the second in my series of monographic studies of the genera of Verbenaceae and Avicenniaceae, the first having been my monograph of the genus Aegiphila published in 1934 [Brittonia 1: 245-477]. In the list of citations of herbarium specimens the following abbreviations of the names of herbaria are employed: A = Arnold Arboretum, Jamaica Plain, Mass.; B = Botanisches Museum, Berlin; Ba = L. H. Bailey Herbarium, Ithaca, N. Y.; Ca = University of California, Berkeley, Calif.; Cb = Conservatoire et Jardin Botaniques, Geneva; Cp = Universitetets Botaniske Museum, Copenhagen; D = Academy of Natural Sciences, Philadelphia; E = Missouri Botanical Garden, St. Louis; Es = Estacion Experimental Agronomica, Havana; F = Field Museum of Natural History, Chicago; G = Gray Herbarium of Harvard University, Cambridge, Mass.; K = Royal Botanic Gardens, Kew; L = Jardin Botanique Principal, Leningrad; N = New York Botanical Garden, New York City; P = Muséum National d'Histoire Naturelle, Paris; R = Trinidad & Tobago Botanical Garden, Port-of-Spain, Trinidad; S = Naturhistoriska Riksmuseet, Stockholm; U = Georgetown Botanical Garden, Georgetown, British Guiana; V = Naturhistorisches Museum, Vienna; W = United States National Herbarium, Washington; Y = Yale School of Forestry, New Haven, Conn.; and Z = H. N. Moldenke Herbarium, Watchung, N. J. To the directors and curators of the above-mentioned herbaria the writer extends his most sincere thanks for their courtesy and kindness in allowing him to study their material of this genus and for their continuous and very generous cooperation throughout the progress of this work. All specimens so studied have been annotated with uniform printed annotation labels and mention is made on each label that the specimen is cited in this monograph. All New World material and all cultivated material thus far received from these 22 herbaria is herein accounted for and cited. Thirty-one other herbaria have been canvassed, but did not contain any New World or cultivated material of this group.

TECTONA L. f. Suppl. 20 & 151. 1781. (a)

Theka Adans. Fam. Pl. 2: 445. 1763. (b)

Nautea Noronha, Verh. Batav. Gen. V, ed. 1, art. 4: 3.  
1790.

Tall trees with soft bark and more or less tetragonal branches and branchlets; leaves deciduous, petiolate or sessile, mostly large and broad, entire, opposite or ternate; inflorescence cymose; cymes numerous, many-flowered, borne in massive terminal panicles (with sometimes smaller axillary ones in the upper axils); flowers hypogynous, actinomorphic; calyx gamosepalous, campanulate, shortly 5-7-lobed, persistent, in fruit greatly enlarged and often inflated, including the fruit and closed above it; corolla gamopetalous, hypocrateriform, white or blue, its tube cylindrical, short, its limb patent or reflexed, 5-7-parted, the lobes subequal, overlapping in bud; stamens 5 or 6, inserted in the corolla-tube, equal, exerted; anthers ovate or elliptic-oblong, 2-celled, dorsifixed, the thecae parallel, opening by longitudinal slits; pistil single, elongate; style terminal, capillary; stigma very shortly bifid, its branches subequal; ovary compound, composed of 2 carpels, completely 4-celled (each carpel 2-celled), each cell 1-ovulate; ovules lateral or high-lateral, hemianotropous; fruit drupaceous, rounded or weakly 4-lobed, completely included by the enlarged fruiting-calyx, with a thin subcarneous exocarp and a thick bony 4-celled endocarp which has a small central cavity between the cells; seeds without endosperm.

The oldest name for this important genus of plants is Theka, first proposed by Rheede in 1683 and again by Adanson in 1763, but, unfortunately, the much later name, Tectona, is included in the list of nomina conservanda of the International Rules of Botanical Nomenclature, edition 3, as adopted at Cambridge in 1930. The genus, because of the type species, T. grandis L. f., source of teak, is the most important and valuable genus of the Verbenaceae from a purely commercial and economic standpoint. Only three species are known, all natives of southern and eastern Asia. Besides the species which will be discussed in full below, there are T. philippinensis Benth. & Hook. f. (c) [Diospyros tectona Blanco; Tectona Hamiltoniana Schau., p.p.], a native of Luzon, which differs in its leaf-blades being only 8-15 cm. long and 3-6 cm. wide, its petioles 5-7 mm. long, and its tomentum very minute, and T. Hamiltoniana Wall. [Tectona ternifolia Buch.-Ham.; Theka ternifolia Hamilt.], a native of the Malay Peninsula, Burma, and Ava, which differs in its branchlets being subglabrous, its leaves usually ternate and their blades about 24 cm. long and 12.5 cm. wide, its petioles about 1.6 mm. long, its panicles 15-30 cm. long, its calyx-teeth acute, and its corolla blue with a villous throat.

The generic name Tectona is taken from the Latin tectonicus in allusion to the use of the wood of these plants in construction, especially of ships and vessels. Theka is an

adaptation of the vernacular Dravidian name "teka". The genus is divided into two sections by Briquet: Sect. Lachnaio-carpae Briq., characterized by an inflated fruiting-calyx and a densely tomentose exocarp, contains only one species, T. grandis; Sect. Leiocarpae Briq., characterized by an enlarged but not inflated fruiting-calyx, closely appressed to the fruit, and a glabrous exocarp, contains the two other known species mentioned above.

TECTONA GRANDIS L. f. Suppl. 151. 1781. (e)

Jatus s. caju jati Rumph. Herb. Amb. 3: 34, t. 18. 1743.

(d)

Tectona Theka Lour. Fl. Cochinch., ed. 1, 137. 1790.

Theka grandis (L. f.) Lam. Illustr. 2: 111. 1793. (f)

Tectona grandis f. abludens Koorders & Valetton, Bijdr.

Booms. Java, no. 7, 171. 1900.

Tree to 50 m. tall; branches and branchlets stout, 4-sided, with large quadrangular pith; twigs stout, very medullose, obtusely tetragonal with rounded angles, usually more or less sulcate between the angles in drying, densely furfuraceous-tomentose with cinereous or ochraceous tomentum; nodes distinctly annulate with usually a corky layer and denser tomentum; principal internodes 4.5-16.5 cm. long; leaves drooping, deciduous, decussate-opposite [or ternate?], short-petiolate or subsessile with a clasping base; petioles very stout, flattened above, rounded beneath, 1-5 (usually 2.5-5) cm. long, more or less margined or alate, densely ochraceous-furfuraceous, or occasionally obsolete; blades firmly membranous or subcoriaceous, very dark green and nitid above, very much lighter and not nitid beneath, broadly elliptic, 11-85 cm. long (to almost 1 m. long on sprouts; mostly 23-55 cm. long), 6-50 cm. wide (mostly 22-37 cm. wide), acute or short-acuminate at apex, entire or repand-denticulate, abruptly acute or long-acuminate at base and prolonged into the alate petiole or clasping at base, densely squamose and rugose (or even bullate) above, becoming glabrate and smooth, densely tomentose, furfuraceous-tomentose, or pubescent beneath with ochraceous, yellowish, reddish, or brownish hairs and densely resinous-punctate, the tomentum sometimes appearing stellate; midrib very stout, somewhat prominent above, very coarsely so beneath; secondaries slender, 9-15 per side, ascending, quite straight and but little arcuate, arcuately joined at the margins, prominent above, prominent beneath; vein and veinlet reticulation very abundant, the tertiaries numerous, issuing at right angles to the secondaries, parallel, usually conspicuous above and prominent beneath; inflorescence axillary (in the uppermost axils only) and terminal, paniculate, massive, the terminal panicles often several feet long and 2

feet or more wide (mostly about 40 cm. long and 35 cm. wide), with distant, opposite, widely divaricate, decussate, many-branched, many-flowered cymes, densely furfuraceous with cinereous or ochraceous tomentum throughout; peduncles and sympodia continuous with the twigs and similar in texture, color, and pubescence, often elongate; pedicels stoutish or slender, 1-4 mm. long, furfuraceous; bracts large and foliaceous, 2 subtending each pair of cymes, resembling the leaves in all respects but smaller; bractlets numerous, lanceolate-linear, to 15 mm. long and 4 mm. wide at base, sessile, ochraceous-furfuraceous, attenuate at apex; prophylla oblong or linear-lanceolate, to 5 mm. long and 1 mm. wide, densely furfuraceous; calyx campanulate, light yellow or light green, 3-4.5 mm. long in all, 3-3.5 (-7?) mm. wide, densely furfuraceous-tomentose, its rim 5-7-toothed or lobed, the teeth ovate or ovate-oblong, 1.5-2.5 mm. long, often reflexed, blunt or obtuse; corolla white (or rosy on the lobes), short-hypocrateriform, glabrous outside and within, its tube broadly cylindrical, 1.5-3 mm. long, about 1.5 mm. wide, its limb 5-7-parted, its lobes obovate-elliptic, 2.5-3 mm. long, about 2.3 mm. wide, rounded at apex, overlapping, erect or reflexed; stamens 5 or 6, inserted about 1.3 mm. below the mouth of the corolla-tube (or lower), equal, somewhat exserted; filaments white, filiform, 2.5-4 mm. long, glabrous, ampliate and flattened below; anthers yellow, ovate or oblong, about 1 mm. long and 0.5 mm. wide, dorsifixed near the base; style yellowish-white, slender, 3.6-5.2 mm. long, glabrate or more or less pubescent with branched hairs; stigma yellowish-white, bifid, its branches 0.2-0.5 mm. long; ovary ovate or conical, 1.5-2 mm. long, about 1.3 mm. wide, densely pubescent, dirty white or rosy when fresh, 4-celled, each cell 1-ovulate; fruiting-calyx greatly enlarged and inflated, to 2.5 cm. long and wide, glabrate, papyraceous, light brown and brittle when dry, mostly irregularly plaited or crumpled and bladder-like; fruit subglobose or more or less tetragonally flattened, to 1.5 cm. long and wide, densely tomentose with irregularly branched, light brown or ochraceous hairs, umbilicate and 4-lobed at apex, 4-seeded (rarely 1-3-seeded by abortion), the exocarp thin, somewhat fleshy when fresh, densely pubescent or tomentose, the endocarp thick, bony, corrugated, 4-celled, with a small central lumen between the cells; seeds oily.

This species is the very important teak tree whose wood is the most valuable of all known timbers. It is undoubtedly the most important and most valuable member of the entire Verbenaceae from the point of view of human economics and trade, commanding a higher price on the market than any timber except mahogany. It is a native of and is widely distrib-

uted in tropical and southern Asia and the Malayan region, being especially abundant in the mixed forests of India, Burma, Siam, and Malaya. Its numbers have been greatly reduced in India and Burma by cutting for the timber, but it is now being maintained in special plantations by the government in numerous suitable parts of the British domain. It has been introduced and become naturalized in the Philippines, Java, and the Fiji Islands, as well as in parts of the New World. In India its northern limit is  $24^{\circ}40'$  on the western side of the Aravalli hills and  $25^{\circ}30'$  N. lat. in the central part near Jhansi. In Burma it extends to  $25^{\circ}30'$ . In Bengal it is not indigenous, but plantations have been made in Assam north to the 27th parallel. In Punjab it is cultivated north to the 32nd parallel.

The tree attains a height of 120-150 feet and a girth of 20-25 feet in its native habitat. Its trunk is straight and often buttressed. It is unmistakable because of its tremendously large leaves and inflorescences, its clasping-based bractlets and prophylla, and inflated fruiting calyces. According to Standley and others, the crown of the tree is often very large and spreading, especially if it stands alone. The timber is yellowish-brown in color, straight-grained, and easily worked. When once seasoned it does not warp or crack. It is very hard and strong and owing to the presence of an aromatic resinous oil is extremely durable. It has no equal for use in tropical climates and is vastly preferred in temperate climates for certain purposes: It is the most valuable wood known for ship building, being especially preferred for armored vessels, since it does not, like oak, corrode the iron. It is exported in large quantities to Great Britain and other countries for use in the building of ships and railway carriages. No satisfactory substitute has ever been found. In Burma the oil is extracted from the wood and used medicinally and also as a substitute for linseed oil and varnish. A tar, used medicinally, is distilled from it, and the leaves afford a red dye used in Malabar for coloring silks and cotton. The large leaves are used as plates, for thatching, and to wrap parcels by native Burmese.

The first good figure and description of this species were given by Rheede in his *Hortus Malabaricus*, vol. 4, p. 57, t. 27, in 1683. Perhaps the best modern illustration of it appears in Brandis, *Forest Flora of North-West and Central India*, vol. 3, t. 44 (1874). The species requires a dry tropical climate and thrives best in India where in the summer it receives the heavy rainfall from the southwestern monsoon and the winter is nearly rainless. In regions of a mean annual rainfall of 50 inches it thrives best; where the mean is only 30 inches teak is more scarce. The most favorable mean annual temperature is between  $75^{\circ}$  and  $81^{\circ}$  F. The tree

is absent near the coast and inland the most valuable forests are situated on low hills up to 3000 feet in altitude. It can inhabit a variety of soils, but perfect drainage or a dry subsoil is the one indispensable condition. Irregularly shaped stems are produced when drainage is poor.

In the dry season the tree is leafless, the leaves falling off in January in hot regions or remaining on the tree until March in moister climates. When the monsoon begins fresh leaves are produced. It is said that on water-sprouts the leaf-blades may become 2-3 feet long and resemble tobacco leaves. They are said to be whorled occasionally when the tree is young and sometimes subglabrous beneath, but I wonder if these statements do not perhaps apply to another species, T. Hamiltoniana. The inflorescences unfold naturally during the rains, usually in July or August in the tree's native haunts, and the seeds ripen the following January or February. Herbarium specimens in anthesis, however, have been examined which were collected in February, June, July, August, September, October, and November, and in fruit in every month of the year except December. The tree can be distinguished from a distance in the rainy season by its large panicles of white flowers held above the leaves and in the dry season by its feathery fruit-bearing panicles. Many seeds are produced and sown every year by a mature tree of this species, but the numerous and devastating forest fires of the dry season in March and April after the seeds have fallen, greatly impede its spread. Heavy rains wash the seeds down the hillsides and thus seedlings and young trees may occasionally be found also in the valleys. Seed germination is very uncertain since so much moisture is needed. When teak grows with bamboo, as it often does, the young teak seedlings are mostly smothered out by the bamboo.

The bark of the trunk is about 1/2 inch thick, gray or brownish-gray. The sapwood is white, the heartwood golden-yellow, with a pleasant, strong, aromatic odor. When seasoned it darkens into brown, mottled with darker streaks. The odor is retained to a great age. Its extraordinary durability is its chief value. In India beams of teak have been found in buildings several centuries old -- in many cases more than 1000 years old. Some instances have been reported where temple beams were more than 2000 years old and still in perfect condition! It is still used on ocean liners, although iron is now employed generally for war vessels. It is also extensively used for furniture, door and window frames, and railway carriages. Termites eat the sapwood, but rarely the heartwood. The teredo bores into it and therefore metal sheaths are used to protect teak piles on wharves. It does not split, shrink, crack, or warp when once seasoned. It takes a beautiful polish, is easily worked, is not heavy,

and has great elasticity and strength. It weighs 38-46 lbs. per cubic foot, 50 cubic feet weighing approximately a ton. When it is green it is heavier than water and will not float. In order to float the timber down streams to the seaports it must be well seasoned first. This is accomplished by girdling -- making a deep circular cut through the bark and sapwood to the heartwood. A tree thus girdled dies and is allowed to stand 1 or 2 years. The wind and sun completely season the wood of such trees in that time, after which they are felled and floated to the seaports. It is not true that teak trees are tapped for oil before being felled in Burma. Several varieties of teak are distinguished in India, Burma, and Java by the color and texture of the wood, but these are not important distinctions in the timber trade. Soil, elevation, climate, and density of forest influence the grain of the wood. An isolated teak tree has more side branches and therefore more knotty and heavier wood. Fires may scorch or even destroy the bark of young trees, causing an irregular crack or hollow in the center of large logs, where decay may commence. The growth of the tree (in plantations) is in youth very rapid -- a 2-year old seedling is 5-10 feet tall. In 15 years the trees are 60 feet tall with a girth, breast high, of 19 inches. When 80 years old the girth is 72 inches and this is a marketable age. Natural timber grows more slowly because of adverse environmental conditions. A natural forest tree with a trunk 24 inches in diameter is 100-200 years old. The species naturally does not grow in pure stands. It is always associated with bamboo and other trees. India uses most of the teak grown there and the demand is greater there than the supply. It is therefore exported from Burma and somewhat also from Java and Bangkok. Rangoon is where it is mostly used for ship building -- European vessels were formerly built here. From 1901 to 1907 an average of 55,994 cubic tons of teak wood was exported from British India per year. In India now government conservation management controls all teak tracts and a permanent and increasing supply is assured.

Common and vernacular names for the species are of course numerous. In Sanskrit it is "gāka" or "saka", in Arabic and Persian "saj", in Mahratti "sag", in Hindu "sāgūn" and "sagwan", in the Dravidian languages "teka" (Malayan "tekka", Tamil "tekku"), in Portuguese "teke" or "teca", and in English "teak". In Cuba it is called "teca" and in Guadeloupe "bois de tek". In the Philippines it is known as "dalanang", "dalandon", "dāti", "djāti", "hadlayāti", "hāti", "kalayāti", "sagunyāti", "téca", and "yāti". In parts of Malaya it is called "iattie" or "djattie". The so-called "African teak" is Oldfieldia africana Benth. & Hook. f., "bastard teak" in

the East Indies is Pterocarpus Marsupium Roxb. and in Bengal is Butea frondosa Roxb., "Ben teak" is Lagerstroemia microcarpa Wight [although this name is also used for low grades of true teak], "New Zealand teak" is Vitex littoralis A. Cunn. (a tree 50-60 feet tall, yielding hard fissile timber indestructible under water), "white teak" is Flindersia Oxleyana F. Muell., the "teak" of Queensland is Dissiliaria baghiooides F. Muell., and the "teak" or "teakwood" of New South Wales is Endiandra glauca R. Br.

The species is widely cultivated in plantations for timber and also as scattered specimens for ornament or because of the great interest attached to this tree. It tends to escape from cultivation and become naturalized in favorable climates. Lam & Bakhuizen [Bull. Jard. Bot. Buitenz. III, 3: 28. 1921] report its cultivation in Delhi. Hallier f. [Meded. Rijks Herb. Leiden 37: 34. 1918] records it as cultivated in Java and Ceylon and cites his C.34a and C.34b from Java and C.34c from Ceylon. E. D. Merrill [Enum. Philip. Pl. 3: 389. 1923] states that it is cultivated in various parts of the Philippines, especially in the Sulu Archipelago and in parts of Mindanao and that it is now established in the southern part of the archipelago. He also notes that "the tree at Tanay, Rizal Province, Luzon, from which Blanco secured specimens before 1837 still exists there". The same author [Enum. Born. Pl. 512. 1921] records it as cultivated in Borneo, while Setchell [Univ. Calif. Publ. Bot. 12: 204. 1926] found it cultivated in the Society Islands. The following list of citations will prove how widely it is cultivated in tropical parts of the New World. In addition to these records, Grey & Hubbard [List Pl. Atkins Instit. 195. 1933] record the species as cultivated in Santa Clara, Cuba, from stock received from Vilmorin-Andrieux & Cie. in 1927, collected by Barbour, Dorsett, & Higgins, 1928-1929. It is there called "teak" or "teakwood".

The species has become naturalized in at least two places in America -- on the islands of Martinique and St. Vincent -- and probably in other localities not yet recorded. Hahn, who collected it on Martinique, found it in the "vallée de S. Pierre", blooming in July. G. W. & H. H. Smith, who collected it on St. Vincent, say that here it is "a large tree" growing in "second growth spurs of Mt. St. Andrews, to 330 m., on the western side. The species may have been introduced, but now grows wild in this locality". Fruit was observed and collected in May. On another label these collectors say that the trees here are about 60 feet tall already in nearby Belaire Valley.

One hundred and thirty-one herbarium specimens and 13 mounted photographs have been examined.

Citations: MARTINIQUE: Hahn 1275 (Cb, Cb, D, G, K, L, S,



S). ST. VINCENT: Smith & Smith 1273 (B, N-photo, Z-photo), 1573 (K). CULTIVATED: Cuba: Santa Clara: Jack 8118 (A), 8174 (A, A, N, N, W, W, W, W); Roig, Acuña, & Malberti s.n. [Herb. Roig 6145] (Es). Jamaica: G. N. Collins 126 [photo 6851] (W); H. A. Lang 616 (D)\* St. Croix: T. Thomson 973 (N)\*. St. Kitts: Britton & Cowell 416 (B, N). Montserrat: Ryan s.n. [Hort. Rohr] (S). Guadeloupe: R. P. Duss 3786 (E, F, L, N, N, N-photo, W, Z-photo). Martinique: Bélanger 1145 (Cb, Cb, Cb)\*; Collector undesignated s.n. (V, V, V, V)\*; R. P. Duss s.n. (B, B, N-photo, Z-photo); Kohaut [Sieber] s.n. (Cp); D. S. Martin s.n. [Ex India occid.] (Cb, Cb)\*. Barbados: Bailey & Bailey 339 (Ba, N-photo, Z-photo); Dash s.n. [Bot. Stat. Herb. Barbados 578] (F, N, N-photo, W, Z-photo)\*. St. Vincent: Guilding s.n. (K). Grenada: Arnott s.n. (K). Trinidad: W. E. Broadway s.n. [July; 1907] (N), s.n. [Sept. 4, 1916] (Ba, D, E, F, G, N-photo, W, Z-photo), s.n. [Trin. Bot. Gard. Herb. 9691] (R); Pinder s.n. [Trin. Bot. Gard. Herb. 8362] (R, R); T. Thomson 375 (K); Whitford s.n. [April, 1920] (Y); Wrbna s.n. [Sieber Fl. Trinit. 27] (B, B, B, B, B, E, K, V, V)\*. Panama: Canal Zone: Bailey & Bailey 466 (Ba); Johansen 50 (W)\*; P. C. Standley 26,900 (W, W); Wetmore & Abbe 227 (A, A). British Guiana: British Guiana Bot. Gard. s.n. [January, 1892] (U, U). French Guiana: Poiteau s.n. [Cayenne] (Cb, Cb, K). Brazil: Rio de Janeiro: Bailey & Bailey 43 (Ba); Guillemin 668 (K, P); A. Richard s.n. [Rio de Janeiro] (K); Warming s.n. [Cult. in Hort. Bot.] (Cp); Weddell 425 [Environs de Rio de Janeiro, 1843] (N, N), 425 [Rio de Janeiro, 1844] (N, N); Whitford 2 (E, F, G, N, S, W, Y). China: Kwangtung: Tsiang 3322 (N). India: Bengal: Kurz s.n. [Cult. Hort. Bot. Calcutt.] (N); Wallich 772 (N); Punjab: R. R. Stewart 1107 (N). Ceylon: Baker 126 (Ca, N, N). Philippines: Luzon: Merrill Sp. Blanc. 837 (N). Java: Kuntze 5334 (N, N).

Geographic distribution of the species of Tectona in the New World and in cultivation:

Martinique, St. Vincent:

T. grandis

Cultivated:

T. grandis [Cuba (Santa Clara), Jamaica, St. Croix, St. Kitts, Montserrat, Guadeloupe, Martinique, Barbados, St. Vincent, Grenada, Trinidad, Panama (Canal Zone), British Guiana, French Guiana, Brazil (Rio de Janeiro), China (Kwangtung), India (Bengal, Punjab), Ceylon, Philippines (Luzon), Borneo, Java, Society Islands, Fiji Islands]

Alphabetized list of citations:

Arnott s.n. (grandis)

Bailey & Bailey 43 (grandis), 339 (grandis), 466 (grand-

is); Baker 126 (*grandis*); Bélanger 1145 (*grandis*); Bot. Stat. Herb. Barbados 578 (*grandis*); British Guiana Bot. Gard. s.n. [January, 1892] (*grandis*); Britton & Cowell 416 (*grandis*); Broadway, W. E., s.n. [Sept. 4, 1916] (*grandis*), s.n. [July, 1907] (*grandis*), s.n. [Trin. Bot. Gard. Herb. 9691] (*grandis*)  
 Collins, G. N., 126 [photo 6851] (*grandis*); Collector undesignated s.n. (*grandis*)  
 Dash s.n. [Bot. Stat. Herb. Barbados 578] (*grandis*); Duss, R. P., 3786 (*grandis*), s.n. (*grandis*)  
 Guilding s.n. (*grandis*); Guillemain 668 (*grandis*)  
 Hahn 1275 (*grandis*); Herb. Roig 6145 (*grandis*)  
 Jack 8118 (*grandis*), 8174 (*grandis*); Johansen 50 (*grandis*)  
 Kohaut s.n. [Sieber] (*grandis*); Kuntze 5334 (*grandis*); Kurz s.n. [Cult. Hort. Bot. Calcutt.] (*grandis*)  
 Lang, H. A., 616 (*grandis*)  
 Martin, D. S., s.n. [Ex India occid.] (*grandis*); Merrill Sp. Blanc. 837 (*grandis*)  
 Pinder s.n. [Trin. Bot. Gard. Herb. 8362] (*grandis*); Poiteau s.n. [Cayenne] (*grandis*)  
 Richard, A., s.n. [Rio de Janeiro] (*grandis*); Roig, Acuña, & Malberti s.n. [Herb. Roig 6145] (*grandis*); Ryan s.n. [Hort. Rohr] (*grandis*)  
 Sieber s.n. [Kohaut] (*grandis*), Fl. Trinit. 27 (*grandis*); Smith & Smith 1273 (*grandis*), 1573 (*grandis*); Standley, P. C., 26,900 (*grandis*); Stewart, R. R., 1107 (*grandis*)  
 Thomson, T., 375 (*grandis*), 973 (*grandis*); Trin. Bot. Gard. Herb. 8362 (*grandis*), 9691 (*grandis*); Tsiang 3322 (*grandis*)  
 Wallich 772 (*grandis*); Warming s.n. [Cult. in Hort. Bot.] (*grandis*); Weddell 425 [Environs de Rio de Janeiro, 1843] (*grandis*), 425 [Rio de Janeiro, 1844] (*grandis*); Wetmore & Abbe 227 (*grandis*); Whitford 2 (*grandis*), s.n. [April, 1920] (*grandis*); Wrba s.n. [Sieber Fl. Trinit. 27] (*grandis*)

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- (a) This generic name is sometimes misspelled "Tectonia" or "Tektona".
- (b) This generic name is sometimes accredited to Rheede, who first used it in his *Hortus Malabaricus*, vol. 4, p. 57, t. 27, in 1683.
- (c) This binomial is sometimes accredited to E. D. Merrill because he first validated it by publication of a description in *Philip. Journ. Sci. Bot.* 5: 227 (1910); however, in this reference Merrill distinctly accredits the name to Bentham & Hooker f., who first effectively published it as a nomen nudum in their *Gen. Pl.* 2: 1152 in 1876. Inasmuch as an author has the right when publishing

a new name to accredit it to whomsoever he wishes, it being assumed that he has a valid reason for so accrediting it, I see no reason why this name should not continue to stand as Tectona philippinensis Benth. & Hook. f.

- (d) This pre-Linnaean name is often cited merely as "Iatus".
- (e) This binomial is often erroneously accredited to Linnaeus the elder or even to Roxburgh.
- (f) This binomial is sometimes erroneously accredited to Linnaeus [vid., Fr. de Montholou, Notices sur l'Indie, p. 60. 1837].

\* The specimens followed by an asterisk in this list of citations do not definitely state on their labels that they were collected from cultivated material, but since the species is more widely cultivated than naturalized in America, the present monographer is assuming that all New World specimens not definitely marked as having been taken from wild plants were from cultivated material. On the other hand, in regard to Old World material (i.e., tropical Asiatic), all specimens not definitely marked as having been taken from cultivated material are assumed to have come from wild plants.